

British naturalist, unfortunately Professor Agassiz's method of nomenclature prevents this desirable result."

Having now examined at length these first articles of Mr. Bell, I shall in future leave like criticisms from him to seek their own answer, and close here, as far as I am concerned, this unprofitable discussion.

Museum of Comparative Zoology,  
Cambridge, Mass., Dec. 30, 1879.

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February 3, 1880.

Professor Flower, LL.D., F.R.S., President, in the Chair.

Captain W. V. Legge, R.A., exhibited a series of specimens of Little Ringed Plovers from Ceylon and Central India; and remarked that it had been a moot point as to whether there really were two species of Little Ringed Plover in India, some writers referring all the birds found in that country to one form—the Lesser Ringed Plover of Europe, *Ægialitis curonica*. This, however (the larger form), was a winter visitant, for the most part, both to the Peninsula and to Ceylon, whereas the smaller form of Ringed Plover was, as far as he could judge, a resident in the latter island, as he had found it breeding there on the shores of the tanks in the northern forests. Jerdon had recognized two species of Ringed Plovers in his 'Birds of India,' the smaller of which (the one now exhibited) he had called *Æ. minuta* (Pallas). Jerdon had pointed out most of the distinguishing characters of this species, viz. its smaller size, the greater amount of yellow on the bill, and its smaller legs and feet, as well as some other features which did not appear to hold good. In addition to the smaller wing, which did not attain a greater length than 4.3 inches, Captain Legge pointed out the black loreal band was narrower, and in many specimens did not extend across the base of the bill at all, leaving the whole of the forehead white; the black pectoral band was likewise narrower; and, in addition to these characters, the naked eyelid was very broad, tumid and protuberant, and deeply corrugated, which did not appear to be the case with the larger species, *Æ. curonica*. Blyth also had remarked, in a paper published in the 'Field' of 28th May, 1870, that the smaller Ringed Plover of Southern India was characterized by its very much broader naked orbital ring; so there could be no doubt that this was a peculiar feature of the bird in question. The note of the species, as observed at its breeding-haunts in Ceylon, was also different from that of the larger form.

Pallas's title *Charadrius minutus*, had been given by that author in the 2nd volume of his 'Zoographia,' p. 145, to a bird found on the lakes of the Barabinski steppes in Western Siberia; and the description was that of the young of *Ægialitis curonica*, which is found in that region. Horsfield had applied the name of *Charadrius pusillus* to a small Ringed Plover from Java; but Mr. Harting had seen

the type specimens, and was able to assert that it was the young of *Ægialitis curonica*; and had in his possession a specimen from Formosa, measuring 4.4 in the wing, which was the facsimile of Horsfield's type. As the smaller Indian Ringed Plover was without a name, Captain Legge proposed that one should be given it, and, after some discussion on the matter, agreed that it should be styled *Æ. jerdoni*, in compliment to Dr. Jerdon, who had pointed out its specific characters, although he had applied an erroneous title to it.

The following papers were read:—

1. On a new Species of Heron from Mohambo, in Northern Madagascar. By Dr. G. HARTLAUB.

[Received January 20, 1880.]

ARDEA RUTENBERGI, n. sp.

*Pileo et nucha cristata nigro-æneis; fascia postoculari rufescenti-fulva, alteraque inferiore latiore et brevior pileo concolori; collo postico et laterali, pectoris lateribus abdomineque medio obscure cinerascens, nonnihil fulvo-brunnescenti lavatis; mento et gula albidis, maculis nonnullis rufescentibus longitudinaliter notatis; collo antico superiore in fundo rufescenti-fulvo, maculis obscurioribus irregulariter vario; inferiore, pectore et epigastrio mediis ex aurantiaco fulvescentibus; abdomine imo, crisso et subcaudalibus eodem colore lavatis; dorso, tergo, uropygio scapularibusque (subelongatis et sublanceolatis) nitide æneo-viridibus, his strictissime et vix conspicue rufescenti marginatis; alarum tectricibus omnibus æneo-virescentibus, dilute rufescenti marginatis; remigibus obsolete virescentibus, limbo apicali strictissimo albido; subalaribus albo et rufescenti variis; cauda virescente; pedibus fuscis; maxilla fusco-nigricante, mandibula flavido-pallida, tomis obscuris. Long. rostr. a fr. 62 millim., alæ 190, tarsi 57, dig. med. c. ung. 53.*

This new Heron is a typical member of the *Butorides* group (*A. virescens*, *scapularis*, *javanica*, etc.), and will take its systematic position next to its nearest ally, *Ardea atricapilla*.

The differential characters of this new bird are very striking ones, and such that to confound it with any of the congeneric species seems out of the question.

The neck and sides of the head, which are of a pure and light bluish grey in *A. atricapilla*, are of a dull brownish grey with an indistinct rufous hue in our new species. The marginal linings of the wing-coverts, whitish in *A. atricapilla*, are of a fine light fulvous-red in *A. rutenbergi*. The underparts, pale bluish grey in *A. atricapilla*, are of a darker brownish grey with a conspicuous shade of ochraceous, and the foreneck and middle of breast are rather of a

clear fulvous-orange; the same colour reappears in the hind part of the abdomen and the under tail-coverts.

But the greatest difference between our new species and *A. atricapilla* is to be seen in the structure and colour of the back-feathers and the scapulars, these being very narrow, elongate and lanceolate, and of a peculiar *sea-green* colour, with hoary margins, in *A. atricapilla*; they are broader, shorter, much less lanceolate, and of a pure and uniform bronze-green in *A. rutenbergi*.

The measurements in both birds are nearly the same.

The fine adult type specimen of *A. rutenbergi*, from which this description is taken, is in the Hamburg Museum of Natural History. I have named the species after my much-lamented young countryman, Mr. Christian Rutenberg, who was murdered by the savage tribes of the west coast of Madagascar. I see from his diary, that he had been eager in collecting and preparing birds; and it is certainly much to be regretted that in all probability his collections are lost.

Dr. Reichenow, of the Berlin Museum, to whose experienced eye I have submitted this little Heron, fully participates in my opinion of its being different from any of the congeneric species.

2. On the *Myoxus elegans* of Temminck. By OLDFIELD THOMAS, F.Z.S., Assistant in the Zoological Department, British Museum.

[Received January 20, 1880.]

The British Museum has lately received a specimen of a small Dormouse obtained by Mr. H. Pryer near Yokohama, which agrees in every respect with Temminck's *Myoxus elegans*, described and figured in the 'Fauna Japonica' (1842). This name had, however, been unfortunately preoccupied by Ogilby for a South-African species<sup>1</sup>, and now stands as one of the synonyms of *Graphiurus capensis*, F. Cuv.<sup>2</sup> I am therefore under the necessity of renaming the Japanese form; and I would propose for it the name of *Myoxus lasiotis*, the tufts of hair at the base of its ears being its most noticeable external character.

This animal by its external form appears to be, as Temminck remarks, very closely allied to the common European *Muscardinus avellanarius*, agreeing more or less with that species both in size, colour, and proportions; but on examining its viscera, I find that there is no trace whatever of that extraordinary complication of the stomach, unique among Mammalia, which has led to the retention, by most recent zoologists, of Kaup's genus *Muscardinus*, formed for the reception of the common Dormouse.

The absence of this complication proves that *Myoxus lasiotis* is not so nearly allied to *M. avellanarius* as Temminck supposed,

<sup>1</sup> P. Z. S. 1838, p. 5.

<sup>2</sup> Cf. Alston, P. Z. S. 1875, p. 317.

because it therefore belongs to the restricted genus *Myoxus*, characterized by a simple stomach and a bushy distichous tail. Its nearest ally is *M. dryas*, Schreb., found in South-eastern Europe, Asia Minor, and Persia.

*Myoxus lasiotis* is, according to Temminck, very rare in Japan: his original specimens were obtained from the province of Awa, in the island of Sikok; and I can find no others recorded until the arrival of this one from Yokohama.

*Note.*—Since writing the above I have discovered that this species has been renamed *M. javanicus* by Schinz, in the appendix to his 'Synopsis Mammalium.' As this name is incorrect and misleading, the species still requires a new name, in accordance with rule xi. of the Stricklandian code.

### 3. Description of a new Species of Simple Coral.

By H. N. MOSELEY, F.R.S.

[Received January 22, 1880.]

#### DESMOPHYLLUM LAMPROTICHUM, sp. nov.

Corallum straight, conical, the upper third expanding much more rapidly than the lower two thirds, moderately compressed. Wall both externally and internally tinged with a madder-red colour, excepting at the base and close to the margin of the calicle. Probably fixed by a narrow base (specimen broken at the base). External surface of the wall covered entirely with a very glistening and transparent epitheca, which is seen where broken towards the base to be present in several successive layers investing one another. Costæ marked as fine striæ over the entire outer surface; the primaries, secondaries, and tertiaries equally developed and more marked than those of lower order. Undulating accretion-lines present on the upper part of the wall.

Calicle oval in outline, ratio of the axes about 86 to 100. Summits of the longer axis slightly higher than those of the shorter. Margin of the calicle nearly even, very slightly excavated opposite the intervals between the septa of the first three orders, and minutely denticulate in correspondence with those of lower order. Septa regular, in six systems and five complete cycles. Primary and secondary septa equal, far exsert, with evenly rounded upper margins; tertiaries much less exsert, with straighter free margins; quaternaries and quaternaries proportionally very small, the quaternaries not extending to the margin of the calicle, the quaternaries reaching thus far only occasionally. Septa white, thin and delicate, slightly sinuous at the inner margins, with lines of granules on their faces. Fossa deep, gradually narrowing inferiorly, bounded by the margins of the primary and secondary septa.

Extreme height of the corallum 35 millims.; extreme length of the calice 35 millims.; extreme breadth of the calice 26 millims.

The single specimen on which the species is founded was purchased from a dealer, Mr. Cutter; and its locality is unknown. It will be placed in the British Museum. Its nearest ally is *Desmophyllum cailleti*, Duch. & Mich., which was obtained during the United-States deep-sea dredging operations from 100 fathoms off Barbadoes, and also off Double-Headed Shot Keys from 615 fathoms<sup>1</sup>. From its appearance the species might be supposed to come from rather deep water; but its having found its way into the hands of a dealer is against this hypothesis.

From *D. cailleti* the present species differs markedly in its colour,

Fig. 1.

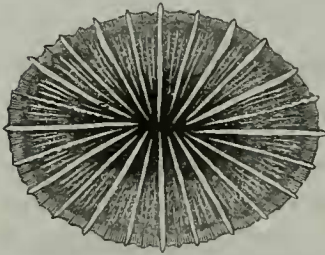
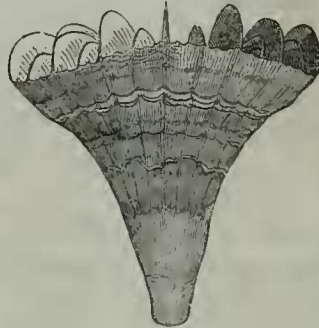


Fig. 2.



*Desmophyllum lamprotichum*, of the natural size.

Fig. 1. View looking directly into the mouth of the calice.

Fig. 2. The corallum viewed from the side.

its larger size, and in its rapidly expanding form, also in the very smooth and glistening appearance of its epitheca. The fact that the entire outer surface of the coral is covered with this shining epitheca would seem to show that this entire surface of the corallum remained covered with living tissue during the whole growth of the animal.

It will probably be necessary to form a special genus for those corals at present included in the genus *Desmophyllum* which are straight and delicate in structure, have a shining epitheca, and never form roots, like *Desmophyllum crista-galli*.

<sup>1</sup> See II. Cat. Mus. Comp. Zool. Harvard, "Deep-Sea Corals," by L. F. de Pourtales (Cambridge, Mass. 1871), p. 16.

4. On *Palæolampas*, a new Genus of the Echinoidea. By F. JEFFREY BELL, B.A., F.R.M.S., F.Z.S., Professor of Comparative Anatomy in King's College, London.

[Received January 27, 1880.]

(Plate IV.)

There is, perhaps, no experience which is more full of instruction to the zoologist than the discovery of forms as recent that have been previously regarded as extinct. In no group of the animal kingdom have the explorations of the last few years reaped so large a harvest as among the Echinoidea, as *Salenia* and *Conoclypeus*<sup>1</sup> would suffice to bear witness, were not such forms as *Phormosoma* and *Asthenosoma* still more remarkable. But there is yet another possibility—possible, indeed, in the case of terrestrial animals, but infinitely more probable in the case of deep-sea forms; it is this: we may at times be fortunate enough to find examples of genera which, though hitherto not registered as fossil, yet proclaim by their general aspect, structure, and relations their archaic characters and the great length of time during which they must have existed as distinct forms. Prime among such creatures stands the remarkable *Brisinga*, which, though “the most primitive and therefore the oldest of all Echinoderms,”<sup>2</sup> has not yet been known to naturalists for a quarter of a century<sup>3</sup>.

Very far from being either as important or as interesting as this ancient Starfish, the irregular Echinid which I now propose to describe to the Society is of interest as filling a gap in our series of forms. Nearly every naturalist who has seen it has at first thought that he had seen it before; but further investigation has, in all cases, led to the view that the form is different from any yet observed. To this statement there is but one exception: Dr. R. H. Traquair, F.R.S.E., of the Museum of Science and Art in Edinburgh, informed me some months ago that he had a specimen generically, if not specifically identical, which had come into his hands when the collection of the late Dr. S. P. Woodward was dispersed. Dr. Traquair most kindly and generously offered to send me notes and drawings of this specimen; but the arduous duties of his post at Edinburgh have been hitherto an obstacle in his way; and while I regret that I have to describe the specimen in the collection of the British Museum without giving an account of the Edinburgh example, I have felt too much sympathy with my friend and colleague to have pressed him too hardly to add to his labours. Some day, perhaps, in the future Dr. Traquair will himself give an account of the form under his care.

The specimen now to be described came into the possession of the Trustees of the British Museum so long ago as January 1852; but it

<sup>1</sup> A. Agassiz, Bull. M. C. Z. v. no. 9, p. 190.

<sup>2</sup> G. O. Sars, ‘Researches on the Structure and Affinity of the genus *Brisinga*’ (1875), p. 94.

<sup>3</sup> ‘Fauna littoralis Norvegiæ,’ ii. (1856) p. 95.

was not mentioned or described by the late Dr. Gray in his 'Catalogue of the Recent Echinida,' published in 1855. It is much worn and has much the appearance of a fossil specimen; in the opinions of Prof. Morris and of Dr. Henry Woodward, F.R.S., however, the specimen is recent. It was bought at Stevens's sale-rooms, and is, with a doubt, reported to have come from India. To the accomplished palæontologist just named I have to express my thanks for instructed guidance through the cabinets under his charge; and while I take on myself all responsibility in describing this form, I would say at once that it is the fact that it was unknown to Dr. Woodward which has chiefly led me to regard it as new.

As we pass in review the edentulous forms of the Irregular Echinoidea, we are led irresistibly to the conclusion that the shortening of the ambulacra and the arrangement of the pores in the mode which has led Prof. Hæckel to give to the group the name of *Petalosticha*<sup>1</sup>, are structural changes which have gone hand in hand; and, just as we may say of the ungulate Mammalia that their limbs tend to become modified by the reduction of the outer digits, and that, where success is attained, this reduction is accompanied by concomitant changes in the relations of the metacarpal or metatarsal bones to the carpus or tarsus<sup>2</sup>, or of the Araneina that they have tended to limit their stigmata to two<sup>3</sup>, so may we say of the *Petalosticha* that the arrangement of the ambulacral pores in straight parallel rows is more ancient than that in which the greater number are set in petaloid fashion. So far the generalization is borne out by the evidence of the palæontological succession, while some of the observations of Alex. Agassiz seem to support it on the embryological side. Perhaps we may go a step further and say, with safety, that the longer, the more regular, and the straighter are, step for step, older arrangements than rows of pores less long, less regular, or less straight. It is obvious that all kinds of stages may be found in this series if the regular and orderly modification of the Echinoderm structure has taken place in the non-saltatory fashion which it is now the mode to ascribe to the process of Evolution; but there is another possible process which it is, after all, not so much more difficult to present distinctly to the imagination; and that is progression by leaps of varying breadth<sup>4</sup>. Prof. Agassiz has drawn attention to the sudden transitions which he has observed in the growth of an individual, and to the apparently sudden appearance of genera in their geological succession. Let us test these two conflicting views by the evidence afforded by the new genus; but before doing so, let us point out that, even if we shall find evidence in favour of the sudden or, as we may call it, saltatory character of the transitions, it is just what we seem to find also in the developmental history of the individual; so that it affords us, just as well as any more steady succession, quite as complete a demonstration of the

<sup>1</sup> Gener. Morphologie, ii. p. lxxiv.

<sup>2</sup> Kowalevsky, Proc. Roy. Soc. 1873, p. 153.

<sup>3</sup> Cf. Bertkau, Archiv für Naturg. 1878, pp. 351 *et seq.*

<sup>4</sup> In the sense, of course, that the intermediate forms were so rapidly passed over that the chance of their being preserved is practically *nil*.

aphorism "The development of the individual is a compressed epitome of the development of the race;" and we may further look for an explanation of the suddenness of the changes in the supposition that between definite points in organization neither the larval form nor the adult are enabled to maintain that equilibrium in the presence of external forces which is necessary to the maintenance of existence<sup>1</sup>. Whether this be so or not, neither the doctrine of Descent nor the "fundamental principle of biogenetic development" has its truth in any way affected thereby.

It is with considerations of this kind in our mind that we must, as I think, address ourselves to the consideration of intermediate forms; for, in our times at least, it is only when observation is kindled by the light of the doctrine of the Descent that the full value of "inosculant forms" can be justly estimated.

#### *Description of the Specimen.*

*Ambulacral system.*—The paired arrangement of the ambulacral pores does not extend beyond the ambitus, which is very nearly reached by all the five sets, but most completely by the two postero-lateral; the two rows of each are, in the case of the postero-lateral and of the anterior ambulacrum, altogether equal; but in the antero-lateral ambulacra the anterior row of pairs of pores is a little shorter than the posterior, and this difference is best marked on the left side; the strictest parallelism is observed between the paired rows, which incline so slightly towards one another that the diminution in breadth of the intraambulacral space cannot be detected by the eye until the pores come close to the central or apical system; here the pores diminish considerably in size, but there is no bare space separating the perforated ambulacral plates from the azygos radial plate, ordinarily known as the ocular. The pores of the inner row in each pair are still fairly circular; those of the outer are more slit-like or comma-shaped; and it is evident, so soon as several different pores have been examined, that the specimen in question exhibits a commencement of that union of the two pores by means of a connecting furrow which is very much more, and quite distinctly, marked in *Echinolampas*, and is even to be seen in *Conoclypeus leskii*, Goldfuss<sup>2</sup>. The spacing-out of the ambulacral pores as they approach the point at which the paired arrangement ceases to obtain is here but barely marked; and, indeed, it would be impossible to detect it at all, were we not led to look for it from the marked degree which it reaches in *Echinolampas*; so, again, while it is in some cases possible to see that the terminal pores of the outer row of the ambulacra are as completely circular as those of the inner row, and so far to find an analogy with the much more marked similarity in *Echinolampas*, yet in the cases of other rows on the same

<sup>1</sup> The probability of sports leading to very considerable and remarkable changes in organization has, comparatively lately, received support from the observations of Mr. Bullar on the hermaphroditism of certain parasitic Isopoda (*Journ. Anat. & Phys.* vol. xi. pp. 118-124).

<sup>2</sup> 'Petrefacta Germaniæ,' tab. xlii. figs. 1, a-c.



specimen the difference between the outer and inner pore can still be observed, just as well as in the upper portion of the rows. What, however, is more remarkable now remains to be noted: the outer row of pores may be traced from the point where they cease to be accompanied by the inner row as far as the actinal region, and that with complete regularity of spacing, and in lines which only here and there diverge from being completely straight; when they reach the phyllode they of course exhibit some modification; but that is of no importance for the moment. What we have here is the regular repartition of one row of pores from the apical to the oral pole. In this, as in several other points, the specimen under description approaches the genus *Conoclypeus*, the existence of which in the present epoch has been lately signalized by Prof. Alex. Agassiz<sup>1</sup>: in *Conoclypeus sigsbei* the paired arrangement of the ambulacral pores does not extend over more than two thirds of the abactinal surface, while *C. anachoreta*, Agassiz (L.), is seen to retain the paired arrangement from the apical to the oral area (see Desor, *Échinides fossiles*, pl. xxxiii. figs. 5-7).

We may find, then: the following series:—

*Conoclypeus anachoreta*: pores in pairs extend over the whole of the ambulacral area.

*Palæolampas*, nov. gen.: pores in pairs extend to the ambitus; outer row extend to the peristome regularly.

*Conoclypeus sigsbei*: pores in pairs extend over part only of the abactinal area; outer rows as in *Palæolampas*.

*Echinolampas*: pores of corresponding paired rows unequal.

*E. depressa*: pores of outer rows extend regularly to actinostome.

*E. oviformis*: pores of outer row not regularly distributed on the plates between ambitus and actinostome.

*Neolampas*: pores in single row (paired arrangement altogether lost).

Whether the mass of their characters is not such as to justify the union of *C. anachoreta* and *C. sigsbei* in a single genus, and the generic separation of the new form (*Palæolampas*), is a point which I will discuss later on. The table as here arranged, seems to throw discredit on the union of *Echinolampas depressa* and *E. oviformis* in the same genus; but there are other points of importance in the structure of the Echinoderm than the characters of the ambulacral system, and these must have their due weight.

The bourrellets of the actinal system are distinct, but they do not project into the buccal cavity; they are well rounded, not pointed at all, and may be said to be due rather to the development of the phyllodes, which mark off the interambulacral periphery of the actinostome, than to any modification in the interambulacral plates themselves; judging from the photograph of *C. sigsbei*, they are less developed than in that new form, while they have no such sharp projection as in *Echinolampas oviformis*; the outer row of pores bends slightly outwards, and then inwards so as to approach its fellow;

<sup>1</sup> Bull. Mus. Comp. Zoology, v. no. 9, p. 190.

between these there are a few pores not very regularly or definitely arranged, but apparently not so extensive as in *C. sigsbei*.

The ocular plates are very distinct; but two of the pores, the anterior median (which is almost obliterated), and the left postero-lateral, are smaller than the rest; those of the right side are both interesting as exhibiting indications of their primitively double character—a point to which Prof. Lovén has called attention in his invaluable 'Études'<sup>1</sup>, and which, as is well known, is so distinctly marked in *Palæechinus* among older forms<sup>2</sup>.

*Interambulacral system.*—The interambulacral areas are composed of large broad plates and are considerably wider than the ambulacral, but there are no points of especial importance to be noted with regard to them; the odd posterior genital plate has disappeared, and the madreporic plate occupies the whole of the central portion of the apical area. The two postero-lateral pores are a very little more widely separated from one another than are the more anterior pair; but the divergence is not in any way so marked as it is either in *Echinolampas* or in *Conoclypeus sigsbei* (cf. fig. 2, p. 190, t. c.): this may be taken as an expression of the greater equality of the several genital ocular plates, and as, *pro tanto*, an indication of a more archaic arrangement.

The anus is elongated from side to side, is of some size, and is placed just below the margin of the test: in *C. leskii* the anus is rounded; in *C. sigsbei* it would appear to be elongated transversely; but in the greater number of the members of the genus *Conoclypeus* it would appear, from the definition of Agassiz and Desor—"anus infra-marginal, allongé dans le sens du diamètre antéro-postérieur"—to be elongated along the axis at right angles to that in which it is elongated in our specimen.

The whole test is covered regularly by primary tubercles, all equal in and of some size; the only region in which there is the very slightest irregularity is in the intraambulacral region just in front of the mouth, where the tubercles are a little less closely packed; this arrangement is exceedingly interesting when compared with what obtains in *Echinolampas*. We have already had some examples of the archaic characters presented by *E. depressa*; and when we compare it on this point with *E. oviformis*, we find that in the former the tubercles are evenly distributed over the whole test, and that there are no bare bands, while in the latter a tract free from tubercles extends both forwards and backwards from the region of the actinostome.

Coming now to the final consideration, we have to inquire into the position of the apical system and of the actinostome. They have both left their central position, but have proceeded a very slight distance forwards; and the distance from the centre of the test is by no means so great as it is in the genera *Echinolampas* or *Rhynchopygus*, though it seems to be greater than in *Conoclypeus sigsbei*.

<sup>1</sup> Lovén, "Études sur les Échinoidées," Kongl. Svens. Vetensk. Handlingar, Bd. ii. no. 7, p. 67.

<sup>2</sup> Dublin Quarterly Journal of Science, v. (1865), plate vii. fig. B.

The actinal surface of the test is completely plane; the abactinal surface is obtusely pyramidal, the area around the ocular and genital pores being flattened out to form what may be called an apical plateau.

I propose to call the genus to which this specimen belongs *Palæolampas*, and to define it thus:—

A petalostichous Echinid in which the completely parallel ambulacral pores remain paired as far as the ambitus, and in which the tendency to the shortening of one of the two sets is only very slightly indicated in the antero-lateral pair; the outer row of each pair of pores is regularly distributed from the apical area to the actinostome. Bourrelets feebly developed. Anus elongated transversely, infra-marginal. Four genital pores; ocular pores large. Tubercles all primary, and equally distributed over the test. Test not very high. Apical system and actinostome a little in front of the true centre of the test.

*PALÆOLAMPAS CRASSA*, nov. sp. (Plate IV.)

Test very thick, with a flattened apical plateau, pores of phyllodes not very regularly arranged; anus looks almost as much backwards as downwards; in the antero-lateral ambulacra the anterior row of pores shorter by three or four pairs than the posterior.

*Hab.* ? India.

The following are the more important measurements of the specimen described:—

|   | millim. |
|---|---------|
| Greatest length .....   | 102     |
| Greatest width .....  | 96      |
| Greatest height .....   | 46      |
| Length of anterior ambulacra .....  | 46      |
| Length of antero-lateral ambulacra (right side) .....                       | 46 : 49 |
| "    "    "    (left side) .....  | 44 : 50 |
| Length of postero-lateral ambulacra (right side) .....                      | 62      |
| "    "    "    (left side) .....  | 63      |
| Distance from anterior edge of actinostome to edge of test                  | 44      |
| Distance from posterior edge of actinostome to posterior edge of test ..... | 50      |
| Greatest antero-posterior axis of actinostome .....                         | 8       |
| Greatest transverse axis of actinostome .....                               | 12      |
| Greatest transverse axis of anus .....                                      | 12      |
| Greatest antero-posterior axis of anus .....                                | 7       |
| Greatest antero-posterior axis of madreporic plate ....                     | 7       |
| Greatest transverse axis of madreporic plate .....                          | 7       |
| Greatest intraambulacral width (from inner pores) ....                      | 10      |
| "    "    "    (from outer pores) ....                                      | 14.5    |

It now remains only to discuss the systematic position of this interesting form. It obviously falls into the edentulous division of the *Petalosticha*, or into the *Petalosticha* as defined and limited by Alex. Agassiz. From the highly modified *Spatangidæ* it is at once distinguished by the absence of the plastron and of the semitæ;



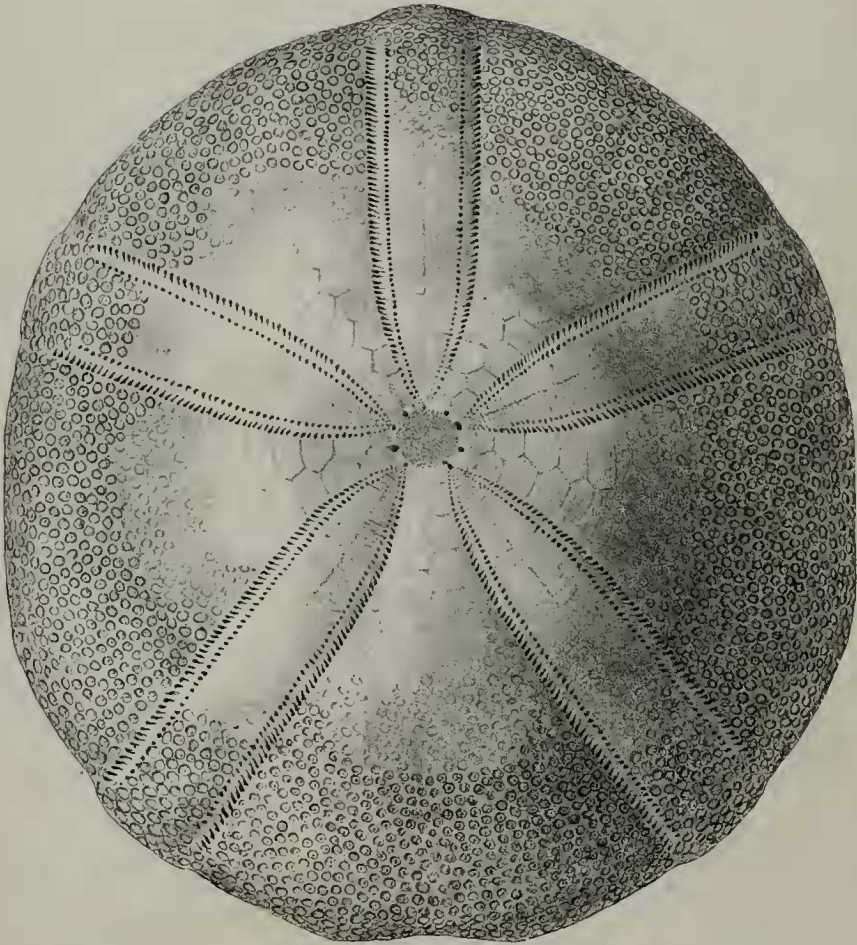
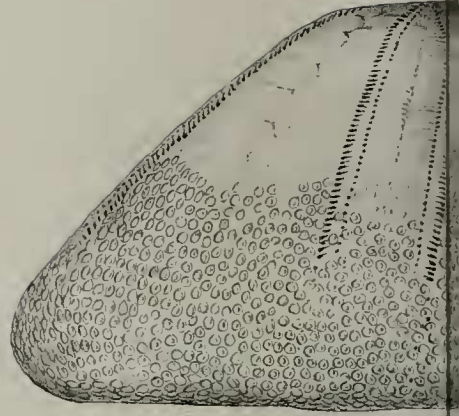
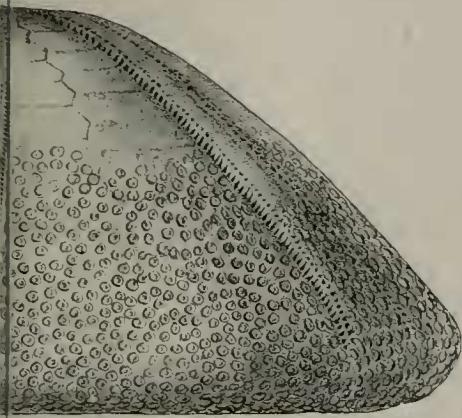


Fig. 1.



3.



4.

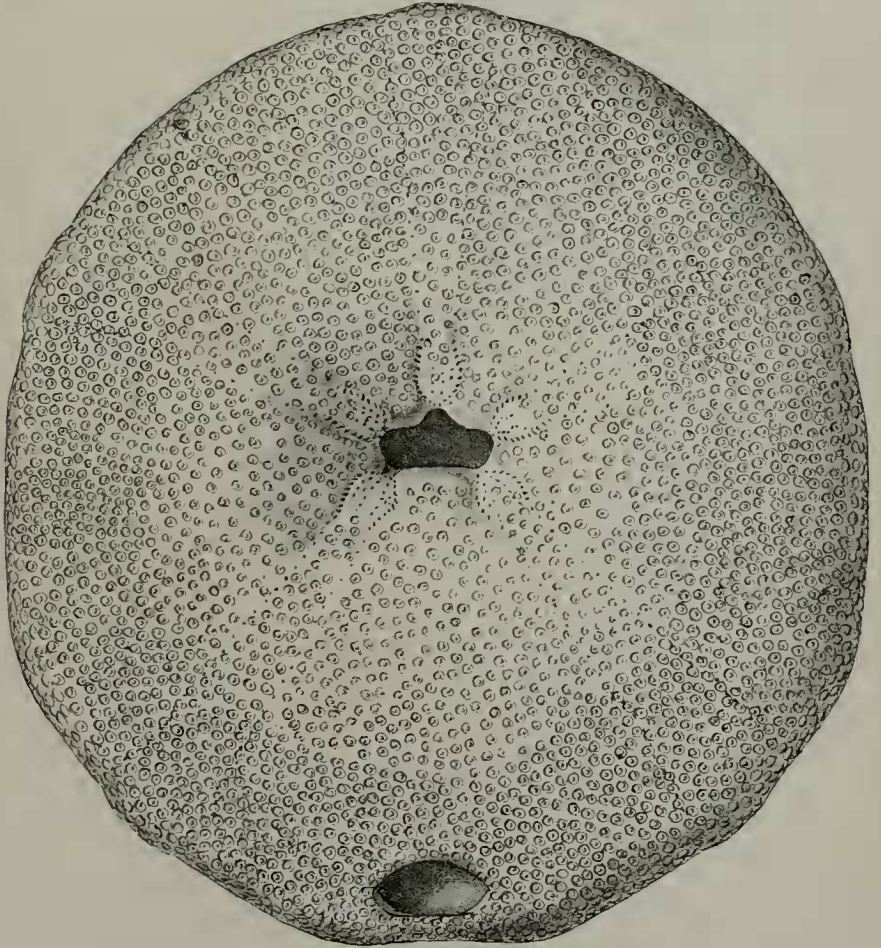


Fig. 2.



from *Echinoneus* it is distinguished by the fact that the paired pores do not extend from apex to actinostome; with the remainder of the Cassidulids, however, it has considerable affinity. In several points it presents resemblances to *Rhynchopygus*; but this curious genus is sharply distinguished by the position of its anus; *Neolampas* has but a double row of simple pores<sup>1</sup> in each ambulacral area; *Echinolampas* has one of its two paired rows of pores considerably shorter than the other in each ambulacrum; and *Conoclypeus*, with which *Palæolampas* presents the greatest affinity, differs from it in having retained the primitive position of the mouth, and in nevertheless having obtained large bourrelets, as well as having the pairs of pores united by grooves<sup>2</sup>; *Conoclypeus* also has the apical system specially modified into a projecting button-like piece, and has the ocular plates very small.

On the whole, then, *Palæolampas* seems still to retain in its organization points of structure which show that it either diverged from the Cassidulid stem rather earlier than *Conoclypeus*, or that it stands in the direct line which connects this genus, first seen in the Cretaceous epoch, with a still more generalized ancestor. As it presents, therefore, a grade in development, we can only justly recognize the value of the characters which it presents by forming for it a special genus; and the name which is proposed seems to be one that it is justified by the characteristics herein detailed.

Returning to the question with which we started, we find, I think, that the existence of an intermediate form of this kind, continued on for so long a period of the world's history, as it is almost certain it has been, must make us very careful as to accepting any statements which seem to throw discredit on that principle of most modern evolutionists, which ascribes the origin of species to the effects of variations, not always seen by the unobservant eye. And while the explanation suggested as to the instability of certain combinations of anatomical characters may throw light on some of our difficulties, it is hardly yet time for us to cease giving the proper weight to our limited opportunities, and the imperfections of the records of the past, or, on the other hand, to forget how species best adapted for investigation are not always those that have most completely retained an uneffaced record of their past changes.

#### DESCRIPTION OF PLATE IV.

- Fig. 1. *Palæolampas crassa*: view of the abactinal surface, to show the disposition of the rows of pores, and the character of the plates of the corona. Natural size.
2. *P. crassa*: view of actinal surface, to show the characters of the bourrelets and phyllodes in the distribution of the ambulacral pores. Nat. size.
3. *P. crassa*: profile view. Nat. size.
4. Abactinal system, enlarged, to show the size of the ocular and genital plates, the characters of the ocular pores, and the position of the madreporic plate.

<sup>1</sup> See Wyville Thomson, 'Phil. Trans.' vol. clxiv. pt. 2, p. 745.

<sup>2</sup> In *C. leskii* the actinostome is some way in front of the centre; but it is a question whether this species truly belongs to the genus *Conoclypeus*.



5. On the Mammals of Asia Minor.—Part II. By CHARLES G. DANFORD, F.Z.S., and EDWARD R. ALSTON, F.L.S., F.Z.S.

[Received February 2, 1880.]

(Plate V.)

Three years ago we gave an account of the species of Mammals observed and collected by Danford during a visit to Asia Minor in the winter and spring of 1875–76, incorporating the statements of the few previous writers on the fauna of that country<sup>1</sup>. The following pages contain the additional information which he obtained during another visit in the winter of 1878–79.

On this second expedition Danford spent most of his time in the extreme south-eastern provinces of Asia Minor. The principal stations where he collected were:—the island of Rhodes; the eastern Taurus Mountains near Marash; the valley of the river Pyramus or Jihan, in the provinces of Marash and Adana; the Giaour-Dagh, a northern continuation of the Lebanon range; and the valley of the river Euphrates, at Biledjik. Thence his route took him through part of the Palanga Plain near Albistan, and the Anti-Taurus Mountains, over the central tableland of Asia Minor by Kaisariyeh, Angora, Sivre-Hissar and Eski-Shehir, to Broussa, near the Sea of Marmora<sup>2</sup>.

Although, as on his former trip, the time spent by Danford in the country was limited to the colder months, still we are able to add *eleven* species to our previous list, of which *one* appears to be new to science. We believe, on the other hand, that *three* species of our first catalogue were wrongly identified; and we now recognize *forty-six* species as being certainly represented in the fauna of Asia Minor, besides nine or ten others of which the occurrence, though recorded, is not fully authenticated. Much still remains to be done by future explorers, especially among the Bats, Insectivores, and Rodents.

As in our previous communication, the species of which specimens were brought home by Danford are marked with an asterisk; while those of which the evidence of occurrence seems doubtful are not numbered and are enclosed in brackets. References are given to our former paper, and the species which were not included in it are indicated by a dagger mark. The same authorities have been consulted as to distribution of the species in the adjoining countries.

We must express our thanks to our friends Dr. Günther and Mr. Thomas of the British Museum, where most of the specimens described have been deposited, and to Professor Alphonse Milne-Edwards of Paris for assistance; also to Dr. Strauch of St. Petersburg, who has kindly given us much information as to the Wild Sheep of South-western Asia.

1. \*VESPERUGO SEROTINUS (Schreb.). Danf. & Alst., no. 1.

<sup>1</sup> P. Z. S. 1877, pp. 270–281, pl. xxxi.

<sup>2</sup> A map, showing Danford's routes in his two expeditions, is given in his "Further Contribution to the Ornithology of Asia Minor," *Ibis*, 1880, p. 81, pl. ii.



J. Smith del.

Hanhart imp.

ARVICOLA GUENTHERI.



## 2. \*†VESPERUGO KUHLI (Natt.).

Specimens of Kuhl's Bat were taken at Marash from the wood-work of a house, and others were shot at Room Kaleh on the Euphrates. The species appeared to be common in both localities.

## 3. \*CROCIDURA LEUCODON (Herm.). D. &amp; A., no. 2.

## 4. ERINACEUS EUROPEUS, Linn. D. &amp; A., no. 3.

As on his former visit, Danford failed to obtain specimens of the Asia-Minor Hedgehog in a fit state for preservation; but he found one or two decomposing carcasses which were evidently referable to this species.

## [FELIS UNCIA, Schreb. D. &amp; A., no. 4.

We introduced the Ounce into our first list on the authority of our friend Mr. D. G. Elliot, who informed us that the type of Valenciennes's *Felis tulliana*, now in the Paris Museum, was not separable from *F. uncia*, an opinion which had been already expressed by Blyth<sup>1</sup> and by Gray<sup>2</sup>. Mr. Elliot has since maintained this identification in his magnificent work on this family<sup>3</sup>, whereas Prof. A. Milne-Edwards regards *F. tulliana* as a distinct species<sup>4</sup>. We regret that we did not ourselves examine the specimen when we were last in Paris; but on finding that the Leopards obtained by Danford on his second expedition were undoubtedly referable to *F. pardus*, we have been led to a more careful comparison of M. Milne-Edwards's detailed description with M. de Tchihatcheff's plate<sup>5</sup>. This examination leaves no doubt on our minds that Valenciennes's specimen is perfectly distinct from *F. uncia*; and we believe that it is really nothing but an unusually pale and long-haired variety of *F. pardus*, somewhat similar to the remarkable Persian Leopards now living in the Society's Gardens<sup>6</sup>. We therefore greatly regret that we should have been led to endorse the existence in Asia Minor of the true Ounce—an animal whose range is probably entirely confined to the most elevated regions of Central Asia<sup>7</sup>.]

5. \*†FELIS PARDUS, Linn. *Kaplan*.

As already stated the only Leopards obtained by Danford belonged to this species; the specimens he preserved present considerable variety in coloration and in proportional length of tail, but not greater than has been observed in other localities. Though nowhere common, the *Kaplan* appears to be generally distributed throughout

<sup>1</sup> P. Z. S. 1863, p. 183.<sup>2</sup> *Op. cit.* 1867, p. 262.<sup>3</sup> Monogr. Felidæ, pt. 2.<sup>4</sup> Recherches Hist. Nat. Mamm. p. 214.<sup>5</sup> Asie Mineure, 2<sup>m</sup>e partie, Zool, pl. i.<sup>6</sup> Cf. P. Z. S. 1878, p. 289.

<sup>7</sup> Since the above went to press we have received a letter from M. Milne-Edwards, in which he says "Le *Felis tulliana*, par les proportions de ses membres, se rapproche beaucoup plus des Panthères véritables que des Onces; les taches de la robe sont plus grandes et plus annulaires, mais elles sont plus nombreuses que chez l'Ounce. Je suis persuadé que le *Felis tulliana* est une espèce, ou au moins une race fortement caractérisée, du Panthère." Impressed as we are with the great variability shown by many other of the Asia-Minor Mammals, we are still of the opinion expressed above.

the south and south-western mountains near the coast. An adult female specimen, the skeleton of which is now in the British Museum, was procured in the Giaour Dagh near Osmanieh on the 20th Jan.; it measured in the flesh:—

|                                   | inches. |
|-----------------------------------|---------|
| Length of head and body . . . . . | 59      |
| Length of tail . . . . .          | 37      |
| Height at shoulder . . . . .      | 26      |

6. \*FELIS CATUS, Linn. *Yaban-kedi*. D. & A., no. 5.

A Wild Cat from the mountains near Marash is strikingly different from the Zebil specimens described in our previous paper. Instead of being of an unusually clear grey ground-colour, marked with distinct dark spots, the present example is very tawny in general tint, faintly but regularly brindled with a darker rufous-grey. There is a distinct black stripe along the upper surface of the tail, the rings of which are imperfect and interrupted, excepting those near the tip. The Asia-Minor Wild Cats would thus appear to be much more variable in coloration than any European specimens which we have examined.

7. \*†FELIS CHAUS, Güld.

This species appears to be tolerably common near Marash, where it inhabits the marshy districts known as the Plain of Bazardjik; skins from this locality do not appear to differ in any way from North-African specimens. The Booted Cat is also found in Southern Persia and in Palestine.

8. \*FELIS LYNX, Linn. D. & A., p. 272.

In our first paper we introduced the *F. lynx* doubtfully, on the strength of a skin purchased in Constantinople. Last year Danford obtained a very fine specimen from the mountains near Albistan, thus proving that the ranges of the Northern and South-European Lynxes meet in Asia Minor. The Albistan skin differs much from the Constantinople one, which was only obscurely spotted. Its ground-colour above is a beautiful silvery rufous, the longer hairs being largely tipped with white; and it is marked with numerous jet-black spots, which are linear in shape on the back and rounded on the flanks; on the thighs the spots show an inclination to group themselves into rosettes, like those of the Leopard.

9. \*FELIS PARDINA, Temm. *Ushek*. D. & A., no. 6.

10. \*FELIS CARACAL, Linn. *Kara-koulak*. D. & A., no. 7.

[\*†FELIS JUBATA, Schreb.

A skin of the Cheetah was presented to Danford at Biledjik, on the Euphrates, by his host Sheik Mustapha, who stated that the animal had been killed among the rocks near Sevi, a small village about five hours down the river on the Mesopotamian side; it was the only specimen which he had ever seen. This Society has received

more than one specimen from Syria, and it is not improbable that the species may be found in some parts of Asia Minor proper. Sheik Mustapha also informed him that five years ago a Lion appeared near Biledjik, and after destroying many horses was done to death.]

11. \**HYÆNA STRIATA*, Zimm. *Zyrtlan*. D. & A., no. 8.

Not rare in the Euphrates valley, near Biledjik, where the natives assert that it understands Arabic and may be taken in the following way:—A man crawls into its den with a noosed rope, and stroking the Hyæna, caressingly says, "You are very nice and pretty and quite like a Lion, indeed you are a Lion." This so flatters the Hyæna that he allows the rope to be put round his neck, and is forthwith dragged out.

[*GENETTA VULGARIS*, Less. D. & A., p. 273.

No further evidence of the supposed occurrence of the Gennet was obtained.]

12. \**HERPESTES ICHNEUMON* (Linn.). *Yer kiopek*. D. & A., no. 9.

Ichneumons were very common in the Pyramus valley.

13. \**CANIS LUPUS*, Linn. *Kurt, Yanovar*. D. & A., no. 10.

Wolves were seen in the Anti-Taurus.

14. \**CANIS AUREUS*, Linn. *Schakal*. D. & A., no. 11.

Jackals were very abundant at Adana.

15. \**CANIS VULPES*, Linn. *Telki*. D. & A., no. 12.

In our previous communication we doubtfully identified an imperfect skin of a Fox as representing a pale long-haired race of *C. vulpes*. A second specimen, from Marash, is darker, and redder above and rather whiter below; the brush has a rudimentary white "tag;" and the fore legs are blackish, with hardly a trace of rufous. The size is small; but, the skull and long bones being unfortunately wanting, we cannot give measurements. After careful comparison we can find no characters by which it can be separated from some South-European specimens of *C. vulpes*.

16. \**MELES TAXUS* (Schreb.). *Porsook*. D. & A., no. 13.

[*ICTONYX ZORILLA* (Thunb.). D. & A., p. 274.

As on his former expedition, Danford did not meet with the Zorille.]

17. \**MARTES FOINA* (Erxl.). *Samsar*. D. & A., no. 14.

Appears to be very common on the hills near Marash, as a great number of fine skins are exposed in the hazaar. Among these no examples of *M. sylvatica* were observed.

18. \**MUSTELA VULGARIS*, Erxl. D. & A., no. 15.

19. †*MUSTELA SARMATICA*, Pall. D. & A., p. 275.

Of this species, which we formerly introduced doubtfully on the

authorities of Ainsworth and Kotschy, skins were seen in the bazaar at Marash which came from Zeitoun, where they are said to be numerous and very destructive to the orchards.

20. \**LUTRA VULGARIS*, Erxl. *Su-itti, Kundush*. D. & A., no. 16.

21. \**URSUS ARCTOS*, Linn. *Aiyee*. D. & A., no. 17.

22. *URSUS SYRIACUS*, Ehrenb. *Aiyee*. D. & A., no. 18.

[*PHOCA*, sp.? D. & A., p. 275.]

23. \**SUS SCROFA*, Linn. *Domooz, Yaban-domooz*. D. & A., no. 19.

24. \**CERVUS ELAPHUS*, Linn. *Süyün*. D. & A., no. 20.

We are inclined to think that the Red Deer does not now exist in the Taurus proper; but it still lingers in the Anti-Taurus, where, however, it is fast dying out, perhaps owing to the advent of great numbers of Circassians. Large heads of recently-killed animals were brought to Danford, and he was well assured of their present existence. These wild and thinly-populated mountains, abounding in high grassy meadows and forests of juniper and other trees, are well fitted to be the last refuge of the Red Deer of these regions. In the northern districts of Asia Minor *C. elaphus* is much commoner; and we believe that it is found throughout the whole range of wooded hills bordering the Black Sea and the west coast at least as far as Broussa, where Danford was shown skins which indicated the great size which this animal attains in the forests of Olympus. All the heads which we have seen from the Anti-Taurus are peculiar in having the brow and bay tines united at the base, and appearing like the bifurcation of one branch.

[At the village of Jarpuz, at the foot of the Bimboghas Mountains near Albistan, Danford obtained from a peasant a very remarkable Deer's antler, in either a subfossil or a greatly weathered condition; and he saw another similar specimen in the same locality. When he exhibited this antler at a meeting of the Society last year<sup>1</sup> there was some difference of opinion as to whether it was or was not an abnormal specimen of *Cervus elaphus*; but as we are ourselves strongly of opinion that it cannot be referred to any known recent Deer, we reserve its description for another opportunity.]

25. \**CERVUS DAMA*, Linn. *Yamoorcha*. D. & A., no. 21.

In the central pine-wooded districts of Rhodes wild Fallow Deer are not uncommon; but the animals appear to be rather small, as might be expected from their insulated range. The following are the measurements of a buck, of about four years old, killed at Laerma in Rhodes on the 22nd December, 1878:—

|                                   | inches. |
|-----------------------------------|---------|
| Length of head and body . . . . . | 48·00   |
| „ tail, with hair . . . . .       | 14·00   |
| „ caudal vertebræ . . . . .       | 9·00    |

<sup>1</sup> P. Z. S. 1879, p. 552.

|                                       | inches. |
|---------------------------------------|---------|
| Length of head . . . . .              | 12·50   |
| "    ear . . . . .                    | 6·50    |
| "    of antlers along curve . . . . . | 18·50   |
| Span of antlers . . . . .             | 16·00   |

The general colour of this specimen was a dark greyish brown above with a darker line running along the back; the legs were fawn-coloured, and the belly pure white.

Both in Rhodes and on the mainland the wild Fallow Deer show but faint traces of the white spots which are so characteristic of the park breed. In the former locality the form of the antlers is very constant; but a series collected in the Giaour Dagh are of very irregular shapes, extra points being commonly thrown out on the beam, and the palmaria being very much less marked than in the normal type.

26. \*CAPREOLUS CAPRÆA, Gray. *Karadja*. D. & A., no. 22.

Appears to be very rare in the south, though occurring in the Giaour Dagh and in the neighbouring portions of the Taurus range.

27. \*GAZELLA DORCAS (Linn.) *Jairan*. D & A., no. 23.

Common all along the valley of the Pyramus, on the Plain of Bazardjik, the stony oak-wooded uplands on the right bank of the Euphrates, and in many other localities. Another Gazelle, which was reported to Danford as being found on the banks of the latter river, will probably prove to be *G. subgutturosa*.

28. \*CAPRA ÆGAGRUS, Gmel. *Kayeek*. D. & A., no. 24.

29. \*OVIS GMELINI, Blyth. *Kotch, Yaban-köyun*. D. & A., no. 25.

Dr. Alexander Strauch, Director of the Zoological Museum of the Imperial Academy of St. Petersburg, visited London in 1878, principally to examine the specimens of the genus *Ovis* in the British Museum, a group which he has made a special object of study. He was much struck with the form of the horns of a Cilician Wild Sheep's skeleton, obtained by Danford on his first expedition, and identified by us as *O. gmelini*. These horns Dr. Strauch considered to be so peculiar as to indicate specific distinction from both the Armenian *O. gmelini* and the Cyprian *O. ophion*; and, at his suggestion, we have been led to reconsider the question of its identity.

On comparing the horns of the skeleton in question, that of an adolescent male (figs. 3, 6), with those of the types of Blyth's *O. gmelini*, also in the national collection (figs. 1, 4), the differences are, indeed, so striking that it is difficult to believe that the animals can belong to the same species. In the Cilician Sheep the terminal portion of the horns are bent boldly upwards, so that their curves strongly resemble those of *O. ophion*. Their sculpture is large but ill-defined, the fronto-nuchal and fronto-orbital edges<sup>1</sup> are well marked but rounded; and both the orbital and nuchal surfaces are flat at the base and then slightly *concave*.

<sup>1</sup> We employ these terms as defined by Sir Victor and Mr. Basil Brooke, P. Z. S. 1875, p. 511.

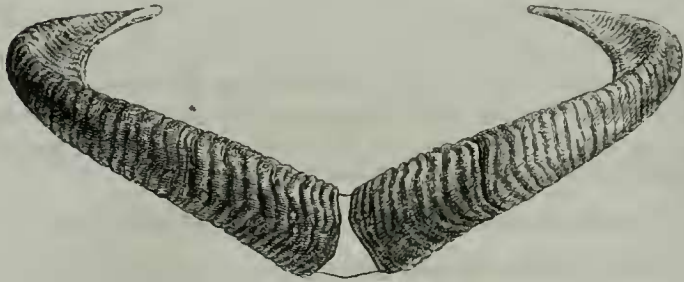


Fig. 1.



*Ovis gmelini*, from Erzeroom (specimen *b* in list); front view.

Fig. 2.



*Ovis gmelini*, from the Cilician Taurus (specimen *c* in list); front view.

Fig. 3.



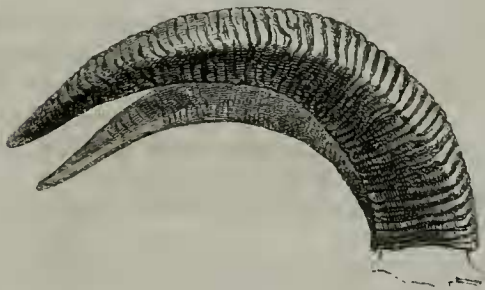
*Ovis gmelini*, from the Cilician Taurus (specimen *e* in list); front view.

Fig. 4.



*Ovis gmelini*, from Erzeroom (specimen *b* in list): side view.

Fig. 5.



*Ovis gmelini*, from the Cilician Taurus (specimen *c* in list): side view.

Fig. 6.



*Ovis gmelini*, from the Cilician Taurus (specimen *e* in list): side view.

But on examining two other pairs of horns from the same locality, in Danford's own collection, we find that they do not present the peculiarities of the British-Museum skeleton, but agree excellently with Blyth's type. In these horns (one pair of which are represented in figs. 2, 5) the terminal portion is only gently bent upwards, the sculpture is small and sharp, the fronto-orbital edge is not distinct, except at the base, and the orbital surface is strongly *convex* throughout, so that towards the middle of the horn it runs almost insensibly into the frontal surface.

As it is hardly possible that two closely allied species should be found together on the Cilician Taurus, the above comparisons appear to us to be of some importance, as illustrating the wide range of variation in the form of the horns in one species of Wild Sheep, and the consequent necessity of examining a large series of specimens of such animals before deciding as to their specific identity. When such series are available from different localities, we suspect that some of the recently described new species will prove to have been founded on individual varieties. With a view to contributing to such material, we have had the accompanying figures prepared, and have drawn up the following list of the specimens examined, with a table of their principal measurements.

a. An enormous head in the British Museum, presented by Mr. W. Burekhardt Barker, and *said* to be from "an island in the Mediterranean" (!).

b. Skin with horns. Erzeroom, Dickson and Ross, in the British Museum. One of the types of Blyth's *O. gmelini*, the others being a ewe and a lamb (figs. 1, 4, pp. 56, 57).

c. Horns, Cilician Taurus, in Danford's collection (figs. 2, 5, pp. 56, 57).

d. Horns, Cilician Taurus, in Danford's collection.

e. Skeleton, Cilician Taurus, Danford, in British Museum (figs. 3, 6, pp. 56, 57).

| MEASUREMENTS.  | a.    | b.    | c.    | d.    | e.    |
|--|-------|-------|-------|-------|-------|
|  | in.   | in.   | in.   | in.   | in.   |
| Length of horn along curve of fronto-nuchal edge .....       | 40.25 | 21.40 | 26.10 | 24.40 | 18.50 |
| Circumference at base .....                                  | 10.30 | 10.25 | 8.60  | 10.00 | 8.60  |
| Circumference at one half of length ...                      | 9.20  | 8.15  | 7.50  | 7.90  | 6.30  |
| Breadth of horns at widest portion, in a straight line ..... | 25.00 | 23.80 | 22.40 | 21.00 | 17.00 |
| Distance from tip to tip, in a straight line .....           | 5.30  | 21.00 | 12.20 | 12.80 | 11.00 |

We have given a description of the colour &c. of Danford's Cilician examples in our former paper; the typical skins of Blyth agree perfectly with them. The males in both cases have no white saddle-mark; and the females are hornless.

Dr. Strauch informs us that the original type specimen of S. G.

Gmelin's "Orientalische Schaaf"<sup>1</sup> is still preserved in the St.-Petersburg Museum. In his opinion it is quite distinct from *O. gmelini*, but agrees with specimens received from North Persia. According to this view (as to which we have no material to found a personal opinion upon), the synonymy of the Asia-Minor and Cyprian Wild Sheep would appear to be as follows:—

#### OVIS GMELINI.

*Ovis gmelini*, Blyth, P. Z. S. 1840, pp. 69, 78 (descr. orig.); ejusd. Journ. As. Soc. Beng. x. pt. 2, p. 886; Fraser, Zool. Typ. pl. xxi. [Based on the Erzeroom specimens now in the British Museum; but Gmelin's "Orientalische Schaaf" is regarded as identical.]

*Ovis anatolica*, Valenciennes, Rev. et Mag. Zool. 1856, p. 346 (descr. orig.); ejusd. Compt. Rend. Ac. Paris, xliii. p. 56; de Tchihatcheff, As. Mineure, 2<sup>me</sup> p<sup>tie</sup> p. 727, pl. iv.

*Hab.* Erzeroom (*Dickson & Ross, Mus. Brit.*); Bulgar Dagh (*Tchihatcheff, Mus. Par.*); Cilician Taurus (*Danford, Mus. Brit.*).

#### OVIS OPHION.

*Ovis musimon*, var.  $\beta$ , *orientalis*, Brandt & Ratzeburg, Mediz. Zool. i. p. 54, pl. ix. figs. 1 & A (descr. orig., 1828, nec Schreber).

*Ovis ophion*, Blyth, P. Z. S. 1840, pp. 73, 78 (ex Brandt & Ratz.); ejusd. Journ. As. Soc. Beng. x. pt. 2, p. 887.

*Ovis cyprius*, Blasius, Säugeth. Deutschl. p. 473, figs. 251, 252 (ex Br. & Ratz.).

*Hab.* Cyprus (*v. Sack, Mus. Berol.*).

We may remark that our national collection does not yet possess a specimen of this latter Wild Sheep, which is supposed to be peculiar to our "youngest dependency."

30. \*SCIURUS SYRIACUS, Hemp. & Ehr. *Dereek, Kallay*. D. & A., no. 26.

31. \*SPERMOPHILUS XANTHOPRYMNUS (Benn.). *Arab-taouchan*. D. & A., no. 27.

Many more specimens were obtained of this little-known Souslik, which was fully described in our first paper; those which were preserved show a remarkable uniformity both in proportions and coloration. The species swarms over the whole barren district of the interior, from Kaisariyeh to Eski-Shehir. A Souslik from Ok Meidan, in European Turkey, obtained through the late Mr. Pearse of Constantinople, proves to be *S. citellus* (Linn.); probably the Bosphorus is the limit between the ranges of the two species. Other animals, apparently belonging to this genus, were observed on the banks of the river Sakaria (Sangarius); these were grey in colour, with pale-yellow breasts, but unfortunately no specimens were procured.

<sup>1</sup> Reise d. Russl., iii. p. 486, pl. lv.; = *Ægoceros musimon*, Pallas, Zoogr. Ross. As. i. p. 230, pl. xix. fig. 7 (part. nec Schreber); = *Ovis orientalis*, Keyserling & Blasius, Wirbelth. Europ. pp. v, 29 (part., 1840), Blasius, Säugeth. Deutschl. p. 472, figs. 249, 250.

[ARCTOMYS, sp.? D. & A., p. 278.

Danford again failed to obtain any species of true Marmot, either in the Taurus, where Ainsworth asserts their existence, or elsewhere.]

[†CASTOR FIBER, Linn.

Very trustworthy authorities at Kaisariyeh told Danford that in the marshes between that place and Indjesu there existed an animal like an Otter, but which had a broad hairless tail. This description points pretty directly to the Beaver, an animal which still exists in the Euphrates near Aleppo<sup>1</sup>, and in the rivers of the Caucasus<sup>2</sup>. The species is included in Smarda's list of the Mammals of Mesopotamia<sup>3</sup>, and, though "with some doubt," in Mr. Blanford's Fauna of Persia<sup>4</sup>.]

32. \*MYOXUS DRYAS (Schreb.). D. & A., no. 28.

33. \*†GERBILLUS ERYTHRURUS, Gray.

A Gerbille was obtained from the stony hill-sides at Kaisariyeh, where the species is reported to be common. It agrees with Gray's types (though not with his description<sup>5</sup>) and with Major St. John's South-Persian specimens<sup>6</sup>, now in the British Museum, in all essentials, but is of a darker and richer rufous above; the lower parts are strongly tinged with yellow; and the elongated hairs on the upper surface of the tip of the tail are rather brown than blackish. The measurements of this specimen, an adult male preserved in spirits, are as follows:—

|                              | inches. |
|------------------------------|---------|
| Length of head and body..... | 5·25    |
| „ tail .....                 | 5·75    |
| „ ear .....                  | ·70     |
| „ hind foot .....            | 1·35    |

The skull is unfortunately much shattered; and the molars are so worn that their pattern is somewhat indistinct. We do not feel any doubt, however, of the identity of the specimen with this species, whose range appears to extend from Afghanistan, through Southern Persia, to Asia Minor.

34. CRICETUS FRUMENTARIUS, Pall. D. & A., no. 33.

35. \*CRICETUS NIGRICANS, Brandt. D. & A., no. 34.

[? CRICETUS ACCEDULA (Pall.). D. & A., no. 35.

In our first list we introduced this species on the faith of the report on one of Dickson and Ross's collections from Erzeroom, where the house-haunting Hamster of Asia Minor is identified as *C. accedula*<sup>7</sup>. The examination of a large series now proves, however, that

<sup>1</sup> Travels of Dr. and Mme. Helfer (English ed., 1879), i. p. 221.

<sup>2</sup> Eichwald, Nouv. Mém. Soc. Nat. Mosc. vii. p. 36.

<sup>3</sup> Geogr. Verbr. der Thiere, p. 408.

<sup>4</sup> East. Persia, ii. p. 51.

<sup>5</sup> Ann. Mag. Nat. Hist. x. p. 266 (1842, descr. orig.).

<sup>6</sup> Cf. Blanford, East. Persia, ii. p. 70.

<sup>7</sup> P. Z. S. 1839, p. 122.

it is referable to the next species; and there appears to be no other evidence of the occurrence of *C. accedula* in Asia Minor.]

36. \*†*CRICETUS PHÆUS*, Pall. *Kara-guz*.

Abundant in houses at Kaisariyeh. Those caught generally had their pouches stuffed with dry pigeon-droppings. It was remarkable that none of these Hamsters ventured into Danford's traps until the house had been cleared of Mice; apparently the latter, in spite of their smaller size, have the upper hand in the murine polity.

[*MUS RATTUS*, Linn. D. & A., p. 279.]

37. *MUS DECUMANUS*, Pall. D. & A., no. 29.

[*MUS ABBOTTI*, Waterh.

Under this name Mr. Waterhouse described a Mouse sent many years ago to this Society from Trebizond by Mr. Keith E. Abbott<sup>1</sup>. His type is not to be found in that portion of the Society's collection which passed to the British Museum; and we can only direct the attention of collectors to his original description. The animal is stated to have been smaller than a Harvest-Mouse (length of head and body 1 inch 3 lines, of tail 1 inch 11 lines), and of a deeper colour than *Mus musculus*. Had the description been given by any less trustworthy writer, we should have had little hesitation in regarding it as having been founded on a young individual of that species.]

38. \**MUS MUSCULUS*, Linn. *Sytchan*. D. & A., no. 30.

Specimens of the common House-Mouse were obtained in various towns and villages, including Oroul, near the Euphrates, where the range of this species overlaps that of *M. bactrianus*. These vary considerably in size and in intensity of colour—some, like the example mentioned in our first paper, being very pale in tint, while others are small and usually dark. Two House-Mice from a village in the Giaour-Dagh are so peculiar in coloration that at first sight they appear to belong to quite a distinct species, their upper parts being of a light fawn which passes insensibly into the still paler and more yellowish fawn of the belly. But we can find no structural differences whatever; and an English variety of *M. musculus* almost identical in tint is preserved in the British Museum.

39. \*†*MUS BACTRIANUS*, Blyth.

Of this species, which is probably, as Mr. Blanford remarks, "the House-Mouse of the extreme north-west of India, Kashmir, Afghanistan, Baluchistan, and Southern Persia," specimens were trapped at Oroul, on the Euphrates, along with *M. musculus*, thus showing that its range extends considerably further west than has hitherto been supposed. Two examples which were preserved agree well with Mr. Blanford's excellent description and figure<sup>2</sup>, and with his Persian specimens in the British Museum, only differing in having slightly shorter tails. Measurements (in spirits):—

<sup>1</sup> P. Z. S. 1837, p. 77.

<sup>2</sup> East. Persia, ii. pp. 56, 57, pl. v. fig. 2.